

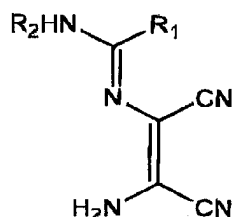
AMENDMENT B
(37 C.F.R. 1.116)

IN THE CLAIMS:

Please amend claims 1-3 in accordance with 37 C.F.R. 1.121. The claims are attached herein on separate sheets.

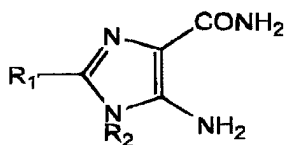
AMENDMENT TO CLAIMS

1. (Currently Amended) A process for the preparation characterized in that a compound represented by formula (II):



(II)

wherein R₁ and R₂ each independently represent a hydrogen atom, an alkyl group of C₁ to C₁₀ which may have substituents, a hydrocarbon group of C₃ to C₁₄ having alicyclic skeletons, an alkynyl group which may have substituents, an aryl group which may have substituents, an aralkyl group which may have substituents, a heterocyclic group which may have substituents, a heterocyclic alkyl group which may have substituents, an N-unsubstituted or substituted carbamoyl group, or an alkoxy carbonyl group and/or an inorganic salt thereof are cyclized and hydrolyzed in an aqueous basic solution involving 1-10 moles of a basic compound per 1 mole of the compound represented by formula (II), in a process for preparing a compound represented by formula (I):

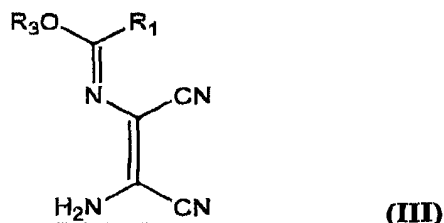


(I)

wherein R₁ and R₂ are the same as defined above, and

wherein in a process for preparing the compound represented by the formula (II), one of the following is used:

a) a compound represented by formula (III)



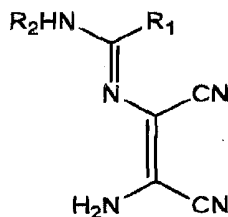
wherein R₁ represents the same as defined above and R₃ represents an alkyl group of C1 to C6, is reacted with ammonia in C1 to C5 alcohol, wherein R₁ represents the same as defined above and R₂ represents a hydrogen atom:

b) a compound of the formula (V): R₁CN wherein R₁ represents an alkyl group of C1 to C10 which may have substituents, a hydrocarbon group of C3 to C14 having alicyclic skeletons, an alkenyl group which may have substituents, an alkynyl group which may have substituents, an aryl group which may have substituents, an aralkyl group which may have substituents, a heterocyclic group which may have substituents, a heterocyclic alkyl group which may have substituents, an N-unsubstituted or substituted carbamoyl group, or an alkoxy carbonyl group, is reacted with diaminomaleonitrile in the presence of an acid, wherein R₁ represents the same as defined above and R₂ represents a hydrogen atom and salts thereof; and

c) diaminomaleonitrile and a compound represented by formula (VI): R₁CONHR₂ wherein R₁ and R₂ each independently represent a hydrogen atom, an alkyl group of C1 to C10 which may have substituents, a hydrocarbon group of C3 to C14

having alicyclic skeletons, an alkenyl group which may have substituents, an alkynyl group which may have substituents, an aryl group which may have substituents, an aralkyl group which may have substituents, a heterocyclic group which may have substituents, a heterocyclic alkyl group which may have substituents, an N-unsubstituted or substituted carbamoyl group, or an alkoxycarbonyl group, are reacted with a compound selected from the group consisting of phosphorous oxychloride, phosphorous trichloride, phosphorous pentachloride, phosphorous oxybromide, diphosphorvl chloride, sulfonyl chloride, sulfuryl chloride, phosgene, diphosgene, triphosgene, and chloroformate trichloromethyl ester, wherein R₁ and R₂ represent the same as defined above.

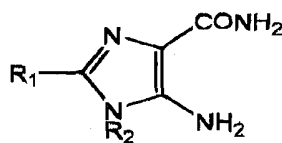
2. (Currently Amended) A process for the preparation characterized in that a compound represented by formula (II):



(II)

wherein R₁ represents a hydrogen atom, an alkyl group of C₁ to C₁₀ which may have substituents, a hydrocarbon group of C₃ to C₁₄ having alicyclic skeletons, an alkynyl group which may have substituents, an aryl group which may have substituents, an aralkyl group which may have substituents, a heterocyclic group which may have substituents, a heterocyclic alkyl group which may have substituents, an N-unsubstituted or substituted carbamoyl group, or an alkoxycarbonyl

group; and R_2 represents a hydrogen atom and/or in inorganic salt thereof are cyclized/hydrolyzed in an aqueous basic solution involving 1-10 moles of a basic compound per 1 mole of the compound represented by formula (II), followed by adjusting the pH to the isoelectric point to precipitate crystal in a process for preparing a compound represented by formula (I):

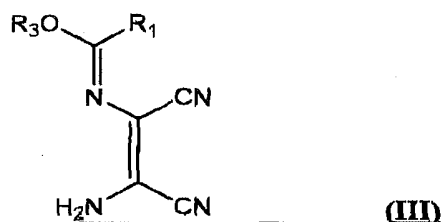


(I)

wherein R_1 and R_2 represent the same as defined above, and

wherein in a process for preparing the compound represented by the formula (II), one of the following is used:

a) a compound represented by formula (III)



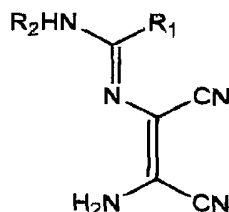
(III)

wherein R_1 represents the same as defined above and R_3 represents an alkyl group of C1 to C6, is reacted with ammonia in C1 to C5 alcohol, wherein R_1 represents the same as defined above and R_2 represents a hydrogen atom;

b) a compound of the formula (V): R_1CN wherein R_1 represents an alkyl group of C1 to C10 which may have substituents, a hydrocarbon group of C3 to C14 having alicyclic skeletons, an alkenyl group which may have substituents, an alkynyl group which may have substituents, an aryl group which may have substituents, an aralkyl group which may have substituents, a heterocyclic group which may have substituents, a heterocyclic alkyl group which may have substituents, an N-unsubstituted or substituted carbamoyl group, or an alkoxycarbonyl group, is reacted with diaminomaleonitrile in the presence of an acid, wherein R_1 represents the same as defined above and R_2 represents a hydrogen atom and salts thereof; and

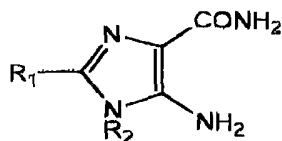
c) diaminomaleonitrile and a compound represented by formula (VI): R_1CONHR_2 wherein R_1 and R_2 each independently represent a hydrogen atom, an alkyl group of C1 to C10 which may have substituents, a hydrocarbon group of C3 to C14 having alicyclic skeletons, an alkenyl group which may have substituents, an alkynyl group which may have substituents, an aryl group which may have substituents, an aralkyl group which may have substituents, a heterocyclic group which may have substituents, a heterocyclic alkyl group which may have substituents, an N-unsubstituted or substituted carbamoyl group, or an alkoxycarbonyl group, are reacted with a compound selected from the group consisting of phosphorous oxychloride, phosphorous trichloride, phosphorous pentachloride, phosphorous oxybromide, diphosphoryl chloride, sulfonyl chloride, sulfuryl chloride, phosgene, diphosgene, triphosgene, and chloroformate trichloromethyl ester, wherein R_1 and R_2 represent the same as defined above.

3. (Currently Amended) A process for the preparation characterized in that a compound represented by formula (II):



(II)

wherein R_1 represents a hydrogen atom, an alkyl group of C_1 to C_{10} which may have substituents, a hydrocarbon group of C_3 to C_{14} having alicyclic skeletons, an alkynyl group which may have substituents, an aryl group which may have substituents, an aralkyl group which may have substituents, a heterocyclic group which may have substituents, a heterocyclic alkyl group which may have substituents, an N-unsubstituted or substituted carbamoyl group, or an alkoxycarbonyl group; and R_2 represents a hydrogen atom and/or an inorganic salt thereof are cyclized/hydrolyzed in an aqueous basic solution involving 1-10 moles of a basic compound per 1 mole of the compound represented by formula (II), followed by adjusting the pH to 9 to 13 to precipitate crystal in a process for preparing a compound represented by formula (I):

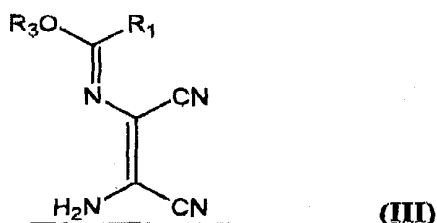


(I)

wherein R_1 and R_2 represent the same as defined above, and

wherein in a process for preparing the compound represented by the formula (II), one of the following is used:

a) a compound represented by formula (III)



wherein R_1 represents the same as defined above and R_3 represents an alkyl group of C1 to C6, is reacted with ammonia in C1 to C5 alcohol, wherein R_1 represents the same as defined above and R_2 represents a hydrogen atom;

b) a compound of the formula (V): R_1CN wherein R_1 represents an alkyl group of C1 to C10 which may have substituents, a hydrocarbon group of C3 to C14 having alicyclic skeletons, an alkenyl group which may have substituents, an alkynyl group which may have substituents, an aryl group which may have substituents, an aralkyl group which may have substituents, a heterocyclic group which may have substituents, a heterocyclic alkyl group which may have substituents, an N-unsubstituted or substituted carbamoyl group, or an alkoxy carbonyl group, is reacted with diaminomaleonitrile in the presence of an acid, wherein R_1 represents the same as defined above and R_2 represents a hydrogen atom and salts thereof; and

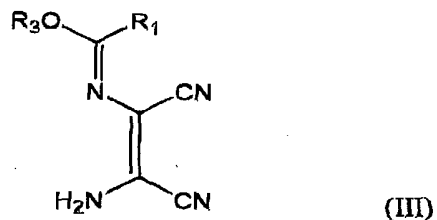
c) diaminomaleonitrile and a compound represented by formula (VI):

R_1CONHR_2 , wherein R_1 and R_2 each independently represent a hydrogen atom, an alkyl group of C1 to C10 which may have substituents, a hydrocarbon group of C3 to C14 having alicyclic skeletons, an alkenyl group which may have substituents, an alkynyl group which may have substituents, an aryl group which may have substituents, an aralkyl group which may have substituents, a heterocyclic group which may have substituents, a heterocyclic alkyl group which may have substituents, an N-unsubstituted or substituted carbamoyl group, or an alkoxycarbonyl group, are reacted with a compound selected from the group consisting of phosphorous oxychloride, phosphorous trichloride, phosphorous pentachloride, phosphorous oxybromide, diphosphoryl chloride, sulfonyl chloride, sulfuryl chloride, phosgene, diphosgene, triphosgene, and chloroformate trichloromethyl ester, wherein R_1 and R_2 represent the same as defined above.

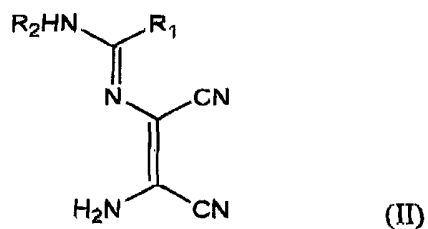
4. (Original) The process for the preparation according to Claim 3 characterized in that the pH is adjusted to a range of 11 to 12.

5. (Original) The process for the preparation according to any of Claim 1 through Claim 4 characterized in that the basic compound is sodium hydroxide or potassium hydroxide.

6. (Withdrawn due to restriction requirement) A process for the preparation characterized in that a compound represented by formula (III):

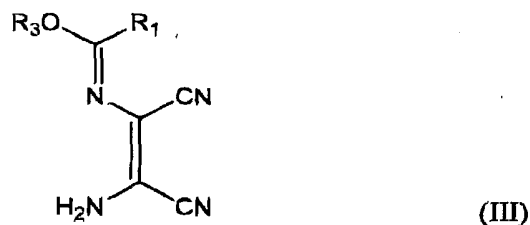


(wherein R_1 represents the same as defined above and R_3 represents an alkyl group of C1 to C6) is reacted with ammonia in C1 to C5 alcohol in a process for preparing a compound represented by formula (II):

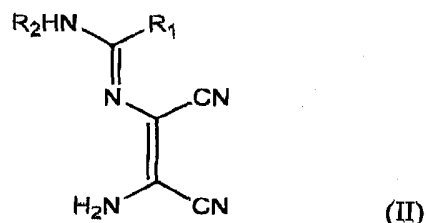


(wherein R_1 represents the same as defined above and R_2 represents a hydrogen atom).

7. (Withdrawn due to restriction requirement) A process for the preparation characterized in that diaminomaleonitrile is reacted with a compound represented by formula (IV): $R_1C(OR_3)_3$ (wherein R_1 and R_3 represent the same as defined above) in C1 to C5 alcohol to produce a compound represented by formula (III):



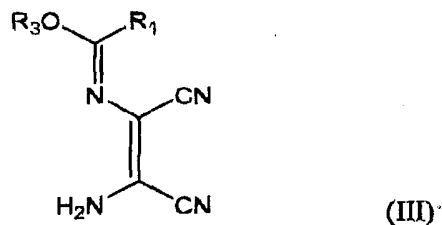
(wherein R_1 and R_3 represent the same as defined above), which is further reacted with ammonia in C1 to C5 alcohol in a process for preparing a compound represented by formula (II):



(wherein R_1 represents the same as defined above and R_2 represents a hydrogen atom).

8. (Withdrawn due to restriction requirement) The process for the preparation according to Claim 6 or Claim 7 characterized in that C1 to C5 alcohol is methyl alcohol or ethyl alcohol.

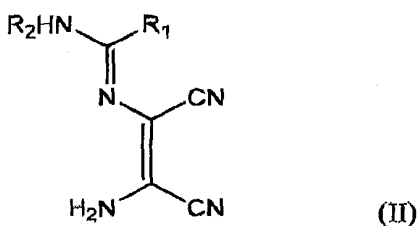
9. (Withdrawn due to restriction requirement) A process for the preparation characterized in that diaminomaleonitrile is reacted with a compound represented by formula (IV): $R_1C(OR_3)_3$ (wherein R_1 and R_3 represent the same as defined above), in C1 to C5 alcohol in a process for preparing a compound represented by formula (III):



(wherein R_1 and R_2 represent the same as defined above).

10. (Withdrawn due to restriction requirement) The process for the preparation according to Claim 9 characterized in that C1 to C5 alcohol is methyl alcohol or ethyl alcohol.

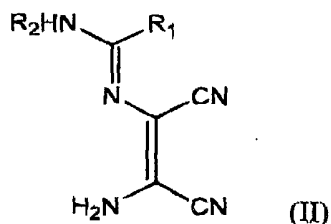
11. (Withdrawn due to restriction requirement) A process for the preparation characterized in that a compound of the formula (V): R_1CN (wherein R_1 represents an alkyl group of C1 to C10 which may have substituents, a hydrocarbon group of C3 to C14 having alicyclic skeletons, an alkenyl group which may have substituents, an alkynyl group which may have substituents, an aryl group which may have substituents, an aralkyl group which may have substituents, a heterocyclic group which may have substituents, a heterocyclic alkyl group which may have substituents, an N-unsubstituted or substituted carbamoyl group, or an alkoxycarbonyl group), is reacted with diaminomaleonitrile in the presence of an acid in a process for preparing a compound represented by formula (II):



(wherein R_1 represents the same as defined above and R_2 represents a hydrogen atom) and salts thereof.

12. (Withdrawn due to restriction requirement) The process for the preparation according to Claim 11 characterized in that the acid is anhydrous hydrochloric acid.

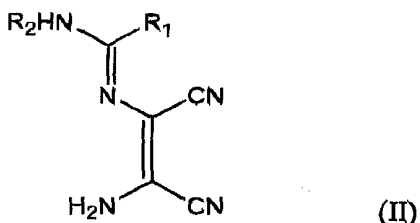
13. (Withdrawn due to restriction requirement) A compound represented by general formula (II):



(wherein R_1 represents the same as defined above and R_2 represents a hydrogen atom) and salts thereof.

14. (Withdrawn due to restriction requirement) A process for the preparation characterized in that diaminomaleonitrile and a compound represented by formula (VI): R_1CONHR_2 (wherein R_1 and R_2 each independently represent a hydrogen atom, an alkyl group of C1 to C10 which may have substituents, a hydrocarbon group of C3 to C14 having alicyclic skeletons, an alkenyl group which may have substituents, an alkynyl group which may have substituents, an aryl group which may have substituents, an aralkyl group which may have substituents, a heterocyclic group which may have substituents, a heterocyclic alkyl group which may have substituents, an N-unsubstituted or substituted carbamoyl group, or an alkoxycarbonyl group), are reacted with a compound selected from the group consisting of phosphorous oxychloride, phosphorous trichloride, phosphorous pentachloride, phosphorous oxybromide, diphosphoryl chloride, sulfonyl chloride, sulfuryl chloride, phosgene, diphosgene, triphosgene,

and chloroformate trichloromethyl ester in a process for preparing a compound represented by general formula (II):



(wherein R₁ and R₂ represent the same as defined above).

15. (Previously Amended) The process for the preparation according to any one of Claims 1 through 3, wherein R₁ in formulae (I) through (II) is

- a hydrogen atom,
- an unsubstituted alkyl group of C₁ to C₁₀ having straight or branched chains,
- an alkyl group having straight or branched chains substituted with halogen atoms, hydroxyl, alkoxy, acyloxy, carbamoyl, oxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkoxycarbonyl, amino groups,
- a hydrocarbon group of C₃ to C₁₄ having alicyclic skeletons,
- an unsubstituted alkenyl group of C₁ to C₁₀ having straight or branched chains,
- an alkenyl group having straight or branched chains substituted with halogen atoms, hydroxyl, alkoxy, phenyl, substituted phenyl groups,
- an unsubstituted alkynyl group of C₁ to C₁₀ having straight or branched chains,
- an alkynyl group having straight or branched chains substituted with halogen atoms, hydroxyl, alkoxy, phenyl, substituted phenyl groups,

a phenyl group,

a phenyl group substituted with halogen atoms, alkyl, alkoxy, phenyl, substituted phenyl,

heterocyclic, aralkyl, heterocyclic alkyl groups,

an unsubstituted aralkyl group having straight or branched chains,

an aralkyl group having straight or branched chains substituted with halogen atoms, alkyl,

alkoxy, phenyl, substituted phenyl, heterocyclic, aralkyl, heterocyclic alkyl groups,

an unsubstituted heterocyclic group,

a heterocyclic group substituted with halogen atoms, alkyl, alkoxy, phenyl, substituted phenyl,

heterocyclic, aralkyl, heterocyclic alkyl groups,

an unsubstituted heterocyclic alkyl group having straight or branched chains,

a heterocyclic alkyl group having straight or branched chains substituted with halogen atoms,

alkyl, alkoxy, phenyl, substituted phenyl, heterocyclic, aralkyl, heterocyclic alkyl groups,

an N-unsubstituted or substituted carbamoyl group,

or an alkoxycarbonyl group

16. (Previously Amended) The process for the preparation according to Claim

1 wherein R_2 in formulae (I) and (II) is

an unsubstituted alkyl group of C_1 to C_{10} having straight or branched chains,

an alkyl group having straight or branched chains substituted with halogen atoms, hydroxyl,

alkoxy, acyloxy, carbamoyloxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkoxycarbonyl,

amino groups,

a hydrocarbon group of C_3 to C_{14} having alicyclic skeletons,

an unsubstituted alkenyl group of C_1 to C_{10} having straight or branched chains,

an alkenyl group of C_1 to C_{10} having straight or branched chains substituted with halogen atoms, hydroxyl, alkoxy, phenyl, substituted phenyl groups,
an unsubstituted alkynyl group of C_1 to C_{10} having straight or branched chains,
an alkynyl group having straight or branched chains substituted with halogen atoms, hydroxyl, alkoxy, phenyl, substituted phenyl groups,
a phenyl group
a phenyl group substituted with halogen atoms, alkyl, alkoxy, phenyl, substituted phenyl, heterocyclic, aralkyl, heterocyclic alkyl groups,
an unsubstituted aralkyl group having straight or branched chains,
an aralkyl group having straight or branched chains substituted with halogen atoms, alkyl, alkoxy, phenyl, substituted phenyl, heterocyclic, aralkyl, heterocyclic alkyl groups,
an unsubstituted heterocyclic group,
a heterocyclic group substituted with halogen atoms, alkyl, alkoxy, phenyl, substituted phenyl, heterocyclic, aralkyl, heterocyclic alkyl groups,
an unsubstituted heterocyclic alkyl group having straight or branched chains,
a heterocyclic alkyl group having straight or branched chains substituted with halogen atoms, alkyl, alkoxy, phenyl, substituted phenyl, heterocyclic, aralkyl, heterocyclic alkyl groups,
an N-unsubstituted or substituted carbamoyl group,
or an alkoxycarbonyl group.

17. (Previously Amended) The process for preparation according to any one of Claims 1 through 3, wherein R_1 in formulae (I) through (II) is
a hydrogen atom,

an unsubstituted alkyl group of C₁ to C₁₀ having straight or branched chains,
an alkyl group having straight or branched chains substituted with halogen atoms, hydroxyl,
alkoxy, acyloxy, carbamoyloxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkoxycarbonyl,
amino groups.

18. (Previously Amended) The process for the preparation according to any one of Claims 1 through 3, wherein R₁ in general formulae (I) through (II) is an unsubstituted alkyl group of C₁ to C₁₀ having straight or branched chains.

19. (Withdrawn due to restriction requirement) The compound according to Claim 13 wherein R₁ in formula (II) is
an unsubstituted alkyl group of C₁ to C₁₀ having straight or branched chains,
an alkyl group having straight or branched chains substituted with halogen atoms, hydroxyl,
alkoxy, acyloxy, carbamoyloxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkoxycarbonyl,
amino groups,
a hydrocarbon group of C₃ to C₁₄ having alicyclic skeletons,
an unsubstituted alkenyl group of C₁ to C₁₀ having straight or branched chains,
an alkenyl group of C₁ to C₁₀ having straight or branched chains substituted with halogen atoms, hydroxyl, alkoxy, phenyl, substituted phenyl groups,
an unsubstituted alkynyl group of C₁ to C₁₀ having straight or branched chains,
an alkynyl group having straight or branched chains substituted with halogen atoms, hydroxyl, alkoxy, phenyl, substituted phenyl groups,
a phenyl group,

a phenyl group substituted with halogen atoms, alkyl, alkoxy, phenyl, substituted phenyl, heterocyclic, aralkyl, heterocyclic alkyl groups,
an unsubstituted aralkyl group having straight or branched chains,
an aralkyl group having straight or branched chains substituted with halogen atoms, alkyl, alkoxy, phenyl, substituted phenyl, heterocyclic, aralkyl, heterocyclic alkyl groups,
an unsubstituted heterocyclic group,
a heterocyclic group substituted with halogen atoms, alkyl, alkoxy, phenyl, substituted phenyl, heterocyclic, aralkyl, heterocyclic alkyl groups,
an unsubstituted heterocyclic alkyl group having straight or branched chains,
a heterocyclic alkyl group having straight or branched chains substituted with halogen atoms, alkyl, alkoxy, phenyl, substituted phenyl, heterocyclic, aralkyl, heterocyclic alkyl groups,
an N-unsubstituted or substituted carbamoyl group,
or an alkoxycarbonyl group.

20. (Withdrawn due to restriction requirement) The compound according to Claim 13 wherein R_1 in formula (II) is

an unsubstituted alkyl group of C1 to C10 having straight or branched chains,
an alkyl group having straight or branched chains substituted with halogen atoms, hydroxyl, alkoxy, acyloxy, carbamoyloxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkoxycarbonyl, amino groups.

21. (Withdrawn due to restriction requirement) The compound according to Claim 13 wherein R_1 in formula (II) is an unsubstituted alkyl group of C1 to C10 having straight or branched chains.